	Budget program (MS Access, aarwp_budget.mdb)
XP	Which version of Access did you use? [Enter 97 or XP for Access 97 or Access XP at the beginning of this line.]
√	The income amounts entered for Biological Inventories, Vital Signs Monitoring, Prototype $$ - Annual Transfer, Water Quality Monitoring and other sources matches the dollar amounts from the memos sent to the regions/networks by WASO (have you used the correct income amounts?).
√	In the Add/Edit Budget Records form, the amount shown for Total Expenses matches that for Total Income. (If it doesn't, enter a record under Expenses in the 7_Other category to make it balance; use an entry such as 'Unexpended funds' or 'Overspent Funds' in the Description column to explain the amount.)
√	For all Expense records, the Description field includes the name of the university, agency, company, or other vendor to help us document our outsourcing efforts. (If this expense involved a contract, cooperative agreement, interagency agreement, or other partnership, is it clear where the money went?)
√	For all Expense records, the correct item from the picklist for 'Where $$ Went' has been entered. [Think about who the check was written to; e.g., enter 'Other Non-Federal' for funding that went directly to the private sector, such as for purchases (computers, supplies, etc.), travel (airlines, rental cars, hotels).]
√	On the Status of Biological Inventories form, there is one record for each inventory that is described in the text section of the AARWP or the budget program for FY 2000-2003 (data should be included for previous years since this is our first year of building this database). Be sure to list each park that was involved in the particular inventory.
√	Each year's budget has been exported as an .rtf file (one for FY 2003 and one for FY 2004), and both files have been inserted into MS Word at the end of the AARWP document.
√	The file aarwp_budget.mdb has been renamed to include the 4-character network alpha code and the years, as shown in this example: NCCN_FY0304_aarwp.mdb
	Annual Report and Work Plan (MS Word)
√	I have carefully read the guidance for the AARWP and followed it.
√	A header or footer with the date that the aarwp was last revised has been included.
√	I gave special attention to the 'Public Interest Highlights' and 'Major Accomplishments' sections of the report. (We need good examples of the successes, applications, and highlights of the program to help us obtain funding for all 32 networks! Your 'Major Accomplishments' section is what we'll use for the I&M Program's annual Report to Congress to justify the funding spent by your network.)
√	In the 'Status of Park Vital Signs Monitoring' table, all entries are equal to or greater than the entries in last year's report. MAKE A NOTE ABOUT THE AT
na	Photographs that might be included in one of the reports to Congress, brochures, websites, or other materials that help the program have been submitted by the network. (See the guidelines for submitting photographs.)
√	The aarwp file has been renamed using the network's 4-character alpha code and the years (FY0304) as in the example NCCN_ FY0304_aarwp.doc
	The annual report has been approved by the appropriate individuals, per my region's procedures. (If you cannot get electronic signatures, it is okay to submit a hard copy with signatures after November 8.)
√	I have followed my region's procedures for submitting the two files (e.g., NCCN_ FY0304_aarwp.doc and NCCN_ FY0304_aarwp.mdb). (Most regions require you to submit the files through the regional office. The files may be zipped into a zip file if desired, and then submitted to Steven Fancy via either email or ftp).
	Review of FY 2004 Work Plan by WASO
no	[Enter Yes or No]: Has the FY 2004 workplan been approved by the network Board of Directors, and therefore ready for the full WASO review? (If you enter No, the WASO I&M and WRD offices will only briefly review the work plan for 'red flags'.

ANNUAL ADMINISTRATIVE REPORT (FY 2003) AND WORK PLAN (FY 2004) FOR INVENTORIES AND VITAL SIGNS MONITORING

FY 2003-FY 2004

NORTHEAST TEMPERATE NETWORK

Includes: Acadia National Park, Appalachian National Scenic Trail, Boston Harbor Islands National Park Area, Marsh-Billings-Rockefeller National Historic Park, Minute Man National Historic Park, Morristown National Historic Park, Roosevelt-Vanderbilt National Historic Park, Saint Gaudens National Historic Site, Saratoga National Historic Park, Saugus Iron Works National Historic Site, Weir Farm National Historic Site

Northeast Temperate Network Approval Signatures

Rolf Diamant, Superintendent, Marsh-Billings-Rockefeller NHP — Date
Network Board of Directors

Elizabeth Johnson, Regional Inventory and Monitoring Coordinator, — Date
Northeast Region

Mary Foley, Chief Scientist, Boston Support Office — Date
Northeast Region

I. Overview and Objectives

The Northeast Temperate Network (NETN) includes ten national parks and historic sites with significant natural resources and for planning purposes, the Appalachian Trail (APPA). The majority (80%) of the fee owned NPS land along the Appalachian Trail occurs within the northeast from Baxter State Park, Maine to the Pennsylvania/Maryland border. During the course of FY03, NETN staff met with the APPA superintendent, the Appalachian Trail Conference, other APPA Inventory & Monitoring (I&M) network coordinators and the national monitoring program director to discuss how to administer ecological monitoring on the Appalachian Trail. The Appalachian Trail crosses 5 I&M networks and 2 prototype parks, with the majority of NPS fee owned land in the northeast. To reduce the amount of coordination for the APPA superintendent and staff with the I&M program, it was determined that the NETN would act as the point of contact for I&M related activities on the Appalachian Trail and be responsible for coordinating efforts among the 5 APPA I&M networks.

Parks in the NETN cover a wide range of temperate forest, from coniferous to mixed deciduous woodlands to transitional forest across Maine, New Hampshire, Vermont, Massachusetts, New York, Connecticut and New Jersey. Two of the parks in the network, Acadia and Boston Harbor Islands, also have important coastal resources. In FY00, FY01, and FY02 the Network received funds from the Servicewide I&M program for biological inventories and database development. Network inventory priorities were described in a five-year study plan submitted in December 2000. As of FY2003, the majority of the biological inventory funds has been or will be committed to projects described in the inventory study plan.

Significant progress was made to complete vegetation mapping in Network parks. ACAD received a final product and network staff participated in the Vegetation Mapping Wrap Up meeting held at Acadia 15-16 October 2003. MORR is underway from 2001 funding, SARA, SAIR, and ROVA now have draft maps and the remaining parks have been flown as of Spring 2003 by the U.S. Forest Service under agreement to produce recent digital orthophotography at WEFA, SAIR, BOHA, MABI, MIMA and SAGA. A project was initiated with NatureServe to evaluate the suitability of conventional vegetation mapping at BOHA, SAIR, and APPA.

Objectives for Biological Inventories

1. Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
2. Complete inventories to document 90% of vertebrates and vascular plants and conduct inventories targeted at taxonomic groups of special concern to Network parks.
3. Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

Objectives for Vital Signs Monitoring

4. Summarize existing data and information.
5. Develop a Vital Signs monitoring plan for network parks.
6. Develop and implement a data management plan.
7. Develop water quality monitoring in the Network parks.

II. Accomplishments (FY2003) and Scheduled Activities (FY2004)

A. Biological Inventories

Objective 1 – Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.

Task 1.1 – NPSpecies Database

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments**: (1) Updates to NPSpecies were managed under a cooperative agreement with the University of Rhode Island (URI). This work entailed data entry, conversion and verification as well as the training of NPS park staff and cooperators in the use of NPS databases; coordinating the review of datasets by taxa experts and developing a system to consistently and accurately populate each park's database with new data. Work conducted by cooperating plant ecologist, Ted Elliman, to identify vascular plants at BOHA and enter that data into NPSpecies is ongoing.
- **Scheduled FY 2004 Activities and Products**: An NPSpecies certification workshop will be held by WASO staff for Northeast Region data management staff, cooperators and park staff. Existing NPSpecies databases shall be reviewed and updated as necessary to include species identified during more recent investigations. (2) APPA has special species data management requirements because of its geographic extent. A cooperator will be found to develop a species and natural resource data management system that will be used by the AT community.

Task 1.2 – Compile and evaluate existing data on vertebrates and vascular plants and enter them in a consistent format into NPSpecies

Parks involved: ACAD

- **FY2003Accomplishments*:*** (1) Glen Mittelhauser (Coastal Maine Biological Research Station) produced 6 separate databases (corresponding to the 6 ACAD administrative units) containing best available information on vertebrates and vascular plants. Taxonomic nomenclature has been updated and standardized and duplicate records have been removed. (2) Supporting evidence has been compiled for several thousand vouchers and 385 geo-referenced observations have been entered into the database. (3) The six individual databases were recombined to create a seventh "all park" database that was reviewed by subject area specialists, certified, and submitted to the Biological Inventories Coordinator for the on-line database.

- **FY 2004 Scheduled Activities and Products**: (1) Work will continue to further populate the voucher and citation information for both vertebrates and vascular plants. (2) Park staff will continue to work with NPS webmasters and ENature to develop and review "Electronic Field Guide" project that will enhance NPSpecies-generated lists on ParkNet. (3) NPSpecies database will be made available to all ACAD staff via the SYNTHESIS Information Management System.

Task 1.3 – Compile, evaluate and populate existing data on vertebrates and vascular plants into NatureBIB
Parks Involved: ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** (1) Scott Tiffney visited MABI, ROVA, and SARA to assess the status of each park's NatureBib database; (2) Updated park NatureBib databases and added: 4568 records for BOHA; 34 records for MABI; 185 records for MIMA; 222 records for MORR; 78 records for ROVA; 95 records for SAGA; 49 records for SAIR; 68 records for SARA; and, 47 records for WEFA; (3) Edited 27 records at SARA; and, (4) Fulfilled NatureBib bibliography requests for Boston Affiliates, Inc. (private data contractor, 1731 citations), Deb DiQuinzio (NPS, 45 citations), Allan O'Connell (USGS, 907 citations), and Marc Albert (NPS, 119 citations).
- **Scheduled FY 2004 Activities and Products:** (1) Quarterly progress reports are due in November 2003, March 2004, and July 2004. (2) NatureBib database updating, editing, and data requests will continue at ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA as needed.

Task 1.4 – Acquire the most accurate, readily available GIS Park boundary files.
Parks Involved: ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** The Environmental Data Center (EDC) at the University of Rhode Island (URI) acquired the best available boundary data, and created a consistent naming convention for these data layers.
- **Scheduled FY 2004 Activities and Products:** Network staff will periodically assess the accuracy of the digital boundary data and will update, revise, or replace files when necessary.

Task 1.5 – Identify existing information and priority inventory needs for APPA.
Parks Involved: APPA

- **FY 2003 Accomplishments:** Network staff worked with APPA staff to review the status of the existing natural resource database and determine database needs for APPA and how national databases will need to account for APPA. Network staff located existing APPA NPSpecies database. Existing database is derived from long-standing trail maintenance database (TREAD), while existing NPSpecies database incorporates files identified on trail prior to 2000.
- **Scheduled FY 2004 Activities and Products:** The network plans to seek funding for a 1-yr. position to focus on biological inventory and data management needs and to gather background information to develop an ecological monitoring strategy for

APPA.

Task 1.6 Utilize peer review process for biological inventory work
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY2003 Accomplishments**: (1) Existing cooperative agreement with Penn State University was extended to provide funding to staff (Dr. Richard Yahner) to review incoming biological inventory data and reports for the NETN. Dr. Yahner reviewed and provided comments on the Acadia National Park Herp inventory.
- **Scheduled FY 2004 Activities and Products**: (1) Continue peer review as data and reports are submitted to the Networks.

Task 1.7 Identify NPSpecies Point of Contact
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY2003 Accomplishments**: The network Board of Directors approved selection of the Network Data Manager as the designated NPSpecies Point of Contact. The network charter was amended accordingly, and the selection was submitted to the Regional Coordinator.

Task 1.8 NPSpecies: data verification, validation, and database certification
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY2003 Accomplishments**: A no-cost time extension was added to the cooperative agreement with the University of Connecticut (Dr. Les Mehrhoff) to verify data on plants in the database for several Northeastern parks. Dr. Mehrhoff has completed his review of the SAGA database, and has begun a review of databases for WEFA, MORR, and MIMA. Dr. Mehrhoff's work is temporarily on-hold pending resolution of problems resulting from the recent release of NPSpecies version 2.
- **Scheduled FY 2004 Activities and Products**: (1) Monitor progress of ongoing vascular plant work; and, (2) Enlist services of recognized regional experts to validate and certify additional NPSpecies database entries.

Objective 2 – Complete inventories to document 90% of vertebrates and vascular plants and conduct inventories targeted at taxonomic groups of special concern to Network parks.

Task 2.1 – Mammal inventories (Principal Investigator A. O'Connell, USGS)
Parks Involved: ACAD, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, WEFA

- **FY 2003 Accomplishments:** Detailed planning for mammal inventory work at the parks listed began in April 2003 including sampling design and equipment preparation. We developed a randomized systematic sampling design based on NPS guidelines by Steve Fancy. In most cases habitat maps were not available for use in the sampling scheme; therefore, we compiled all available digital map data and used digital aerial photographs to develop habitat maps. A stratified systematic sampling scheme was developed in ArcGIS 8.3 (ESRI, Inc.), which automated sample point generation using

the developed habitat maps for each park. Initial site visits were made to all parks, except ACAD and BOHA, for scoping and evaluation of map accuracy. Maps were updated and where necessary, sample points were regenerated. In addition, we have developed data sheets for a handheld computer device, which will allow us to eliminate data entry errors while increasing data entry speed.

- **FY 2004 Scheduled activities and products**: Andrew Gilbert and a technician (to be hired) will begin locating and establishing sampling points for the inventory during fall 2003 in preparation for a battery of techniques. Each park will be sampled four times over the next year in each season for a period of one week each visit for live trapping (small and medium-sized mammals) and 2-3 weeks for remote photography, track plates, and hair sampling. Sampling will be completed at all parks by the end of FY04, at which point most data will have been entered. Compilation of species data and analysis will follow. Species data will be entered into NPSpecies and all voucher specimens will be processed and accessioned into ACAD holdings. A proposal to sample mammals and herps at BOHA will be drafted and submitted.

Task 2.2 – Avian inventories (Principal Investigator P. Paton, URI)
***Parks Involved*:** ROVA, SAIR, WEFA, BOHA, MORR, MIMA, SARA

- **FY 2003 Accomplishments:** A second year of Variable Circular Plot point count surveys for breeding birds the 7 park units listed above. Random points surveyed in 2002 were resampled at smaller units (ROVA, SAIR, WEFA, BOHA, and MIMA) while a random selection of previously unsampled points were surveyed in MORR and SARA. Field technicians were recruited and hired to conduct surveys in all parks from May 25 to June 30, 2003. In addition, comprehensive surveys of breeding waterbirds (including Common Eider, gulls, cormorants, herons, terns, and oystercatchers) were conducted at BOHA through a variety of methods in both years, based on the results of a pilot survey done in 2001. Data has been compiled into two separate databases. A manuscript summarizing BOHA data, comparing Paton et al. findings to historical data, and presenting specific management recommendations was submitted in August 2003. All data collected in 2002 and 2003 has been entered into a relational database created by NPS I&M staff and is currently undergoing QAQC.
- **FY 2004 Scheduled Activities and Products:** Avian survey data will be compiled and summarized for a final report describing the spatial distribution and abundance of birds in each park. In October 2003, Research Associate Carol Trocki will participate in a vital signs scoping workshop for the Boston Harbor Islands Partnership and present this research at the Boston Harbor Islands Science Symposium. All products will be submitted to the Park Service for final review.

Task 2.3 – Avian inventories (Principal Investigator S. Faccio, VINS)
***Parks Involved*:** MABI, SAGA

- **FY 2003 Accomplishments:** To address lack of information on the distribution and relative abundance of breeding birds in 2 parks located in northern New England, a 2-year inventory was completed. A variety of field techniques were used to document avian species, including point count surveys, audio playbacks, and active searches.
- **FY 2004 Scheduled Activities and Products:** Project completed. Final reports and database submitted before 31 December 2003.

Task 2.4 – Marsh Bird inventories (Principal Investigator J. Longcore, USGS)
***Parks Involved*:** ACAD

- **FY 2003 Accomplishments:** Field work began in early spring including several quite observation sits to observe wetland use by migrant avian species, especially waterfowl. The margins of the study areas were traversed to locate nesting raptors. Maps were generated of study areas and randomly located plots were delineated for sampling. Most data has been entered into an Access database. A breeding least bittern was detected at Bass Harbor Marsh.
- **FY 2004 Scheduled Activities and Products:** Project completed. Final reports submitted before 31 December 2003.

Task 2.5 – Avian inventory; Purple Sandpipers (Principal Investigator G. Mittlehauser)
***Parks Involved*:** ACAD

- **FY 2003 Accomplishments:** To address lack of information on the distribution and ecology of Purple Sandpipers wintering in the ACAD region, Maine, Mittlehauser continued winter surveys and banding efforts on this high priority species. During banding efforts, 68 individuals were captured and blood samples were taken from 35 individuals. Numbers and distribution of birds were determined during 23 offshore winter surveys. Analysis of survey and genetic data in underway.
- **FY 2004 Scheduled Activities and Products:** Complete analysis of population survey data, morphometrics analysis, and genetic assessment. Convert important survey information into NPSpecies databases for ANP.

Task 2.6 – Avian inventory; Harlequin Ducks (Principal Investigator G. Mittlehauser)
***Parks Involved*:** ACAD

- **FY 2003 Accomplishments:** We read band codes on 127 Harlequin Ducks during 22 days of field effort in the Isle au Haut region, Maine. In addition, we used capture-recapture data from a 5-year field study of individually marked Harlequin Ducks wintering at Isle au Haut, Maine to examine patterns in age and sex specific apparent survival and local movements.
- **FY 2004 Scheduled Activities and Products:** Continue to conduct field work to at ACAD.

Task 2.7 – Invasive plant inventories
***Parks Involved*:** MABI, MIMA, SAIR

- **FY 2003 Accomplishments:** To control and manage invasive plant species, comprehensive baseline field surveys were needed to identify the invasive plant species, assess their abundance, and map their distribution. A systematic GIS grid system was emplaced over the parks, entered into a portable differential GPS backpack, or used in combination with aerial digital orthophoto images to map all invasive plant species within each park. All listed parks have been completely sampled in the field and data is being entered into a GIS database.
- **FY 2004 Scheduled activities and products:** Data entry will be completed and GIS maps and metadata will be created. A final report will be generated and submitted by 12/03, including an analysis of all invasive plant species abundance and mapped

distributions as well as suggested strategies for future management.

Task 2.8 -- Vascular Plant Inventories
***Parks Involved**:* ACAD

- **FY 2003 Accomplishments:** In conjunction with College of the Atlantic, park staff (Linda Gregory) worked on two projects. 1) Completed distribution and abundance survey for 24 high management priority invasive plant species in ACAD. A systematic on the ground survey was completed and each species occurrence was mapped and geo-referenced. 2) For the Flora Project, over 100 voucher specimens were collected for plant species known to occur in ACAD with no voucher record. Verified existence and identifications of park vouchers at two non-park herbaria (UNH and MAINE). Incorporated new data into NPSpecies database.
- **FY 2004 Scheduled Activities and Products:** Publish Greene et al. (2003) as a NPS technical report. Verify existence and correct identifications of park vouchers at NEBC herbarium. Incorporate all data into final "*Flora of Acadia National Park*" report and NPSpecies, PLOTS and NatureBib databases. Submit "*Flora"* manuscript to *Rhodora*, journal of the New England Botanical Club.

Task 2.9 – Inventory of reptiles and amphibians (Principal Investigator J. Behler, WCS)
***Parks Involved*:** ACAD, MIMA, MORR, SAGA, SAIR, SARA, WEFA

- **FY 2003 Accomplishments:** Amphibian and reptile inventory surveys began in 2000 at MORR and WEFA and have continued at new parks each year. In 2002, we prepared the first network park report for ACAD. The report was peer reviewed for content and accuracy. In addition, all of the data collected was plotted and the database reviewed for accuracy by Dennis Skidds at URI. URI also prepared species distribution maps for inclusion in network reports
- **FY 2004 Scheduled Activities and Products:** Analysis of data, summary of results and assessment of the distribution and status of species. All final reports, databases and other deliverables will be submitted during FY2004.

Task 2.10 – Inventory of inter-tidal fishes (Principal Investigator L. Kling, UMaine)
***Parks involved*:** ACAD

- **FY 2003 Accomplishments:** Fish were inventoried during two field seasons, 2001 and 2002 at Acadia. The objective was to sample as many diverse habitats as possible in the inter-tidal and estuarine zones to maximize the resultant species lists. The fieldwork component of the project has been completed. We are presently entering data into Microsoft Access and Excel for the data inventory and analysis required. We have completed most of the information required in the tidepool section, but have substantial work remaining for the estuarine component.
- **FY 2004 Scheduled Activities and Products**: The project report will be completed in November 2003. Mr. Jordaan will also be presenting some of the work at a science symposium in Acadia National Park in early November.

Task 2.11 – Inventory of freshwater fish (Principal Investigator M. Mather, UMASS)
Parks involved: WEFA, ROVA, MABI, MIMA, SAGA, SARA, MORR, SAIR

- **FY 2003 Accomplishments:** Fish were inventoried during two field seasons, 2001

and 2002 at parks listed above and a list of fish species present at SAIR was develop from existing information. All data were entered into NPSpecies.

- **FY 2004 Scheduled Activities and Products:** Project completed. Final reports submitted.

Task 2.12 – Inventory of vertebrate museum specimens (Principal Investigator A. O'Connell, USGS)

Parks involved: ACAD, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, WEFA

- **FY 2003 Accomplishments (From 10/02 - 9/03):** Completed analysis of voucher data and final technical report. Submitted final voucher specimen data to the park service including >31,000 voucher records of which >4,000 were determined to have been collected within park boundaries. Presented the results of this work to the George Wright Society meeting. Prepared formal manuscript for submission to a peer-reviewed journal (Accepted to Conservation Biology).
- **FY 2004 Scheduled activities and products (From 10/03 - 9/04)**: Project completed (Manuscripts submitted and either in press or undergoing review).

Objective 3 – Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

Task 3.1 – Vegetation Mapping (NY Natural Heritage)

***Parks involved*:** ROVA and SARA

- **FY 2003 Accomplishments:** All NY NPS sites were visited and contacts were made with appropriate NPS staff. All available in-house datalayers were compiled and reviewed. Additional datalayers were provided by individual NPS staff (e.g., year 2000 color digital orthoimages for SARA). Preliminary digital maps were developed for each NY NPS site by first reviewing 1995 NAAP CIR aerial photos and then screen digitizing boundaries using 1994-99 digital ortho-corrected quarter-quadrangles (DOQQ) as the base layer. NY Natural Heritage produced a draft classification of National Vegetation Classification (NVC) associations predicted to be at each National Park Service site by using EcoART. The draft classifications include all NVC types that are known to occur within the ecoregional sections containing the NPS site. SARA and ROVA are within section 221B of the Lower New England – Northern Piedmont Ecoregion. A draft subset of the New York ecological communities predicted at each park was produced using the current NY Natural Heritage classification. All vegetation cover data were collected in the field using hand held computers. CIR air photos flown by USFS, William Frament, and orthophotos developed by Frament (ROVA) and NCState University (SARA) were provided in the summer-fall of 2003
- **FY 2004 Scheduled Activities and Products:** Additional fieldwork will be conducted through September and October 2003. Element Occurrence Ranking Forms will be completed for all significant occurrences. All new significant occurrences will be transcribed and previously documented occurrences will be updated and entered into Biotic 4 by April 2004. Species and plot data will be formatted into an Excel spreadsheet for use in the PC-ORD version 4.0 Multivariate Analysis package during winter 2003-2004. Initial results will be reported on by

April 2004. First drafts of the final classification will be written late spring to early summer 2004. Accuracy assessment will be conducted spring through early fall 2004 by NY Natural Heritage staff not involved in the initial data collection to reduce/eliminate bias.

Task 3.2 -- Development of keys to NVC associations in the Lower New England (LNE) and North Atlantic Coast (NAC) ecoregions (NatureServe)
Parks Involved: SAGA, MIMA, SAIR, ROVA, SARA, MORR, WEFA, BOHA

- **FY2003 Accomplishments:** 1) Draft keys and classification documents were prepared for the North Atlantic Coast ecoregion. These were submitted in CD and hard copy to the NPS on July 22, 2003. 2) A subcontract to the New Hampshire Natural Heritage Bureau was prepared so that the ecologist previously hired by NatureServe could continue her work in her new capacity. She revised the Lower New England classification by incorporating information from revised state classifications and from NPS documents. 3) A three-day meeting of heritage ecologists from ME, NH, VT, MA, CT, RI, NY, PA, NJ, DE, and NatureServe Boston office was held at the Yale Forestry Camp in CT. Changes recommended from this meeting were incorporated and a new revision of the classification was produced. Draft keys and classification were submitted on hard copy and CD to the NPS in July 2003.
- **FY 2004 Scheduled Activities and Products:** The classification and keys for all three ecoregions will be submitted to heritage ecologists for review. Comments from NPS and heritage ecologists will be incorporated into the final reports to be submitted in December 2003.

Task 3.3 -- Conduct a vegetation mapping feasibility study (NatureServe)
Parks Involved: APPA, BOHA, SAIR

- **FY2003 Accomplishments:** A site visit to SAIR was made in July 2003, at which recommendations for sampling and mapping the tidal marsh were given. A document of NVC types and their descriptions were provided. A draft vegetation map at SAIR was generated in conjunction with the invasive plant inventory conducted at SAIR.
- **FY 2004 Scheduled Activities and Products:** A site visit to BOHA is planned for October with Ted Elliman, Ecologist, who has been working on a floristic inventory at BOHA. A conference call with heritage ecologists from APPA states is planned for late fall, at which time mapping issues will be discussed. Final report will be submitted in January 2004.

Task 3.4 -- Identify mapping subcontractor and ecologists to produce vegetation maps
Parks Involved*: MIMA, MABI, SAGA*

- **FY2003 Accomplishments:** Agreements between NPS and NatureServe were signed in July 2003. NatureServe has begun communications with heritage programs in NH and VT regarding the collection of plot data, analysis of the data, and production of park-specific classifications. NatureServe has also initiated communications to assess their capacity to produce vegetation maps. A potential contractor has been identified for collection of plot data on MIMA. NatureServe has begun background work to identify a potential mapper, with one solid lead obtained thus far.

- **FY2004 Scheduled activities and products**: NatureServe will write contracts for heritage programs in NH and VT to conduct field work, data analysis, and mapping. A contract will be written for field work and data analysis at MIMA, and a mapper will be identified and subcontracted.

Task 3.5 -- Vegetation mapping at Acadia (USGS)
Parks Involved: ACAD

- **FY2003 Accomplishments:** Acadia National Park was selected as one of several pilot parks to develop and refine methodology and standards for the USGS-NPS Vegetation Mapping Program. The three basic components of this project were vegetation classification, vegetation mapping and map accuracy assessment. Color infrared aerial photography collected in late May 1997 at a scale of 1:15,840, specifically for this project, was used for photointerpretation. Samples from 179 vegetation sampling plots were collected during 1997-99 and analyzed with previously collected plot data. Fifty-three natural/semi-natural communities (associations of the National Vegetation Classification System) were described and are represented by 33 map classes and five land/use cover classes. The map covers 96,693 hectares (246,347 acres), all of ACAD's legislated boundary including park easements. The final report makes recommendations for improving the efficacy of the USGS-NPS vegetation mapping program based on the ACAD project.
- **FY2004 Scheduled Activities and Products:** A wrap-up meeting of this project is scheduled at ACAD in October to review recently received final products: a detailed final report; spatial database coverages of the vegetation map and associated data, digital files and hard copy data sheets of fieldwork; representative photos of vegetation communities; aerial photographs of the project area, their corresponding interpreted overlays and flight line index; metadata; and a CD-ROM containing all associated project components.

Task 3.6 -- Land-cover classification and change assessment (Principal Investigator Y. Q. Wang, URI).
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** Acquired no-cost Geographic Information System (GIS) data from state-level agencies in ME, VT, NH, MA, CT, NY, PA, and NJ. Acquired 25 no-cost Landsat scenes, dated from 1973 to 2001, from the University of Maryland's Global Land Cover Facility. Completed initial ground observation exercises for ACAD, MABI, SAGA, and selected portions of APPA in Maine. Met with National Park Officials in ACAD, MABI, and SAGA to discuss project and areas of interest both inside and outside park boundaries. 1363 digital photographs (1022 georeferenced, 341 traditional) were recorded and 1042 miles were driven over eight days. Began process of incorporating these digital images and the GPS data collected in the field into a Virtual Field Reference Database (VFRDB). Published website specifically for this project: http://www.ltrs.uri.edu/nps_lulc/. The website is used to communicate the status of this project to park resource managers and other interested parties.

- **FY 2004 Scheduled Activities and Products:** Purchase GIS and remote sensing data necessary for completing data library. Complete initial ground observation exercises at remaining parks and follow-up as warranted. Complete VFRDB for each park. Complete preliminary land-cover data. Submit preliminary land-cover data with accompanying report to the NETN coordinator and each respective park. Begin process of refining land-cover data based on comments received from park resource managers.

B. Vital Signs Monitoring

Objective 4 – Summarize existing data and information.

Task 4.1 - Review Resource Management Plans and park documents

- **FY2003 Accomplishments**: The NETN staff reviewed existing park resource management plans for inclusion in the Phase 1 report.
- **Scheduled FY 2004 Activities and Products**: Review RMPs for remaining parks in the network. Hire 2 positions (Acadia and Marsh-Billings-Rockefeller NHP) to data mine within park datasets, populate Dataset Catalog, and initiate the process of digitizing documents to be served on a network webpage.

Task 4.2 – Plan for and hold a Vital Signs Selection Workshop

- **FY2003 Accomplishments**: The I&M staff met with all park superintendents and resource managers to introduce the I&M program, assess park resource management priorities, summarize key park resources, and evaluate current park monitoring programs.
- **Scheduled FY 2004 Activities and Products:** continue to work directly with park staff to identify priority ecological systems and species for monitoring. Establish 1 yr position to focus on synthesizing existing information and developing ecological monitoring strategy for APPA.

Task 4.3 - Summarize Regional Monitoring Programs

- **FY2003 Accomplishments**: The network data manager developed a database to catalog ongoing monitoring programs adjacent or applicable to parks in the NETN. The network cooperated with the State University of New York to hire a research assistant to populate the database and identify programs, contacts, objectives, duration and indicators. Presently, 171 ongoing programs have been identified, summarized, and are stored in the database.
- **Scheduled FY 2004 Activities and Products**: Continue to populate the ongoing monitoring program database with a special emphasis on the Appalachian Trail.

Objective 5 – Develop a Vital Signs monitoring plan for network parks.

Task 5.1 – Develop conceptual ecological models and identify indicators

- **FY 2003 Accomplishments:** (1) A cooperative agreement was established with Drs. James Gibbs, Brian Underwood, and Don Faber-Langendoen at the State University of New York College of Environmental Science and Forestry (SUNY ESF) to

develop a Vital Signs Monitoring Program for the Northeast Temperate Network. As part of this agreement, SUNY ESF will implement Phase I (background and conceptual modeling) and Phase II (prioritization and selection of indicators) parts of the Vital Signs program. (2). A field trip was made to Saratoga National Historic Site and to Marsh-Billings-Rockefeller National Historic Site. (3) Ben Rubin and Shawn Carter were hired as post-doctoral associates for the project.

- **FY 2004 Scheduled Activities and Products:** Complete park-based conceptual models and develop a list of prioritized indicators for the parks. Hold a Vital Signs selection workshop to select network Vital Signs. Convene a park, board, and technical steering committee meeting to present, review and revise list of selected Vital Signs. Submit draft Phase 2 report.

Task 5.2 – Draft Phase 1 and 2 reports (Chapters 1, ,2 and 3 of monitoring plan)

- **FY2003 Accomplishments**: The network coordinator, data manager, and university partners drafted and submitted the Phase 1 report. The report includes background information to the I&M program, summaries of parks, resource management priorities, threats to park natural resources, and conceptual models for ecological systems within parks.
- **Scheduled FY 2004 Activities and Products**: Continue to revise and edit the Phase 1 report to incorporate comments and feedback from the national office, park staff, and outside reviewers. Draft and submit chapter 3 of the monitoring plan (Phase 2).

Objective 6 – Develop and implement a data management plan.

Task 6.1 – Acquire the most accurate, readily available GIS Park boundary files.
Parks Involved: ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** The Environmental Data Center (EDC) at the University of Rhode Island (URI) acquired digital orthophotography for each park and used these data to produce a seamless park centered background image.
- **Scheduled FY 2004 Activities and Products:** None anticipated

Task 6.2 – Acquire all readily available park related GIS datasets.
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** Network staff is currently acquiring datasets from a variety of sources, including State and other Federal agencies, non-governmental organizations, cooperators, and other sources. Data from these disparate sources has been downloaded and organized both geographically and categorically. At this time, cooperators working with the network have populated the National Park Service Dataset Catalog with more than 700 known data sets.
- **Scheduled FY 2004 Activities and Products:** Additional GIS data will be acquired as their whereabouts are identified. Data acquired during FY 2003 shall be assessed for accuracy, existence of metadata, and general usefulness. Further, the Northeast Temperate Network has agreed to cooperatively fund a project with Acadia National Park to inventory and obtain copies of natural resource oriented datasets. The work

will build upon the existing northeastern based dataset catalog that currently contains in excess of 700 listings. Datasets identified in the existing catalog that the network does not currently possess will be acquired, and data under current development will be added to the catalog.

Task 6.3 – Adapt the NPS Database Template to Northeast Temperate Network projects.
Parks Involved: ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** Network staff worked with USGS cooperators to develop a mammal inventory database. In addition to collecting trapping data, a module of the database (currently under development) will enable cooperators to enter data related to specimen collections and export that data to the NPS collections system, ANCS+.
- **Scheduled FY 2004 Activities and Products:** NETN staff will continue to work with other network staff to develop the ANCS+ interface, and on an as-needed basis develop data entry forms and database modules for NPS Staff and cooperators.

Task 6.4 – Develop comprehensive data collection and delivery standards.
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** NETN staff have reviewed and commented on projects within the network that were funded by the network or individual parks, making recommendations to improve data acquisition.
- **Scheduled FY 2004 Activities and Products:** NETN staff shall incorporate and adapt existing data collection standards for the network to be used by cooperators, park and network staff, and others to establish desired data formats, accuracy standards, minimum required documentation, and general project background.

Task 6.5 – Distribute data to broad audience.
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** NETN staff reviewed traditional NPS data outlets, network web pages, and other data distribution options, and discussed development of a web page with cooperators at the University of Massachusetts (UMASS).
- **Scheduled FY 2004 Activities and Products:** NETN staff intends to work with cooperators at UMASS to develop an informational web page (phase 1) that also offers cooperators, park staff, and the general public an efficient way to obtain NETN oriented data.

Task 6.6 – FGDC Metadata
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments:** The NETN, in cooperation with other Northeast Region networks, entered into a Cooperative Agreement with North Carolina State University (NCState) to assist cooperators in generating FGDC compliant metadata for biological inventory datasets.

- **Scheduled FY 2004 Activities and Products:** In addition to continuing to work with NCState cooperators, the NETN will establish requirements that FGDC compliant metadata be compiled for all future projects funded by the NETN.

Task 6.7 – QA/QC
Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2003 Accomplishments*:*** NETN staff and cooperators have developed and reviewed datasets and deliverables originating from existing projects, evaluating them for accuracy and completeness with reference to any standards established at project commencement. Projects include; APPA and BOHA veg. inventories (T. Elliman), BOHA NWI map and report (R. Tiner), NETN mammal inventory database development (A. O'Connell), NETN monitoring program database (K. Whiteleather), NETN avian inventories (C. Trocki), NETN herp inventories (D. Skidds), ACAD herp report (D. Brotherton), ACAD vegetation map (K. Hopp).
- **Scheduled FY 2004 Activities and Products:** Controls shall be established to ensure that all network derived data is of a known and acceptable quality. The Network QA/QC requirements shall address, where applicable: protocols and standards; standard operating procedures; data verification, validation, and editing; data documentation & metadata standards; and, data summaries and analyses.

Objective 7 – Develop a water quality monitoring in the Network parks.

Task 7.1 – Draft scoping report for NETN network parks
***Parks Involved*:** ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, WEFA

- **FY 2003 Accomplishments:** Water Quality Scoping is being accomplished through an interagency agreement with USGS Maine the FY 2003 accomplishments apply to all parks but ACAD and BOHA. Completed draft descriptions of past and current inventory or monitoring related to freshwater resources. Drafted conceptual models of NETN key ecosystems. Identified current and emerging threats for NETN ecosystems and important agents of change that could impact NETN aquatic resources. Summarization of information from State 305(b) reports and 303(d) lists to USEPA
- **FY 2004 Scheduled Activities and Products:** Complete above items for ACAD and BOHA. Identify priority water quality indicators for each park and make recommendations for implementation of a long-term water quality monitoring program for each park in the NETN. Describe freshwater body types present within the park using existing published information such as classifications from NWI and bathymetry maps. Identify specific freshwater resources that are of unique importance on watershed or regional scales. Calculate freshwater body area statistics based on park-GIS coverages, National Wetland Inventory databases, and State coverages. Identify network-wide water-quality objectives and candidate monitoring variables.

III. Staffing

Inventory and Monitoring Staff

Beth Johnson, Northeast Regional I&M Coordinator
Greg Shriver, Northeast Temperate Network I&M Coordinator
Fred Dieffenbach, Northeast Temperate Network Data Manager

Board of Directors

Rolf Diamant, Superintendent Marsh-Billings-Rockefeller National Historical Park
Sheridan Steele, Superintendent Acadia National Park
Pamela Underhill, Superintendent Appalachian National Scenic Trail
George Price, Superintendent Boston Harbor Islands National Park Area
Nancy Nelson, Minute Man National Historical Park
Michael Henderson, Superintendent Morristown National Historical Park
Sarah Olson, Superintendent Roosevelt-Vanderbilt National Historic Site
Steven Kesselman, Superintendent Saugus Iron Works National Historic Site
Doug Lindsay, Superintendent Saratoga National Historical Park
Randy Turner, Superintendent Weir Farm National Historic Site
BJ Dunn, Acting Superintendent Saint Gaudens National Historic Site
Mary Foley, Chief Scientist Boston Support Office
Elizabeth Johnson, Regional I&M Coordinator University of Rhode Island
Greg Shriver, Northeast Temperate Network Coordinator

Technical Steering Committee Members

Brian Underwood, USGS, SUNY Syracuse, Wildlife Biologist
Sam Droege, USGS Patuxent, Monitoring Program Developer
David Manski, Acadia National Park, Chief Natural Resource Manager
David Hayes, Roosevelt-Vanderbilt NHS, Natural Resource Specialist
Christopher Eagar, USFS, Forest Ecosystem Ecologist
Wayne Millington, NPS, IPM
Tonnie Maniero, NPS, Air Quality
Mary Foley, NPS, Regional Chief Scientist
Charles Roman, NPS, Wetland Ecologist, North Atlantic Coast CESU Coordinator
Brooke Childrey, Acadia National Park, Curator
Beth Johnson, NPS, Regional I&M Coordinator
Fred Dieffenbach, NPS, NETN Data Manager
Greg Shriver, NPS, NETN Coordinator

IV. Reports, Publications and Presentations

Bell, R. Intertidal habitat inventory: Boston Harbor Island National Park Area. Boston Harbor Islands Science Symposium, Boston Museum of Science 7 October 2003.

Castellano, C. M., J. L. Behler, R. P. Cook, D. K. Brotherton. 2003. National Parks in the Northeast: Preserving America's Herpetological Heritage. Herpetological Review 34(3), 192-193.

Gilbert, A. T. and A. F. O'Connell, Jr. 2003. Retrieval, Compilation, and Organization of Vertebrate and Vascular Plant Voucher Specimens Originating from National Parks. Harmon, D., ed. Proceedings of the 13th Conference on *Protecting Our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites*. Hancock, MI: The George Wright Society.

Greene, C.W., J. Weber, S. Rooney, and K. B. Anderson. 2003. Invasive Plant Species Distribution and Abundance in Acadia National Park. (In review).

Lubinski, S., K. Hop, S. Gawler. 2003. USGS-NPS Vegetation Mapping Program: Acadia National Park, Maine. U.S. Geolological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin, July 2003. 52 pp + Appendixes A-I.

Mittelhauser, G. 2003. The distribution and ecology of Purple Sandpipers wintering in the Acadia National Park region, Maine: spring 2003 data update. Unpublished report to Acadia National Park, Maine. 51 pp.

Mittelhauser, G.H. 2002. Local survival and movements of Harlequin Ducks (*Histrionicus histrionicus*) wintering at Isle au Haut, Maine, 1997-2002. Unpublished report to Acadia National Park, U.S. Fish and Wildlife Service, and Maine Department of Inland Fisheries and Wildlife. 43 pp.

Mittelhauser, G.H. (In Press). Apparent survival and local movements of Harlequin Ducks wintering at Isle au Haut, Maine, 1997-2002. Pages 00-00 *in* Robertson, G.J. and P.W. Thomas (Eds.), Harlequin Ducks in the Northwest Atlantic. Canadian Wildlife Service Occasional Paper, No. 000. Ottawa.

Mittelhauser, G.H., J.B. Drury, and E. Morrison. (In Press). Behavior and diving of Harlequin Ducks wintering at Isle au Haut, Maine. Pages 00-00 *in* Robertson, G.J. and P.W. Thomas (Eds.), Harlequin Ducks in the Northwest Atlantic. Canadian Wildlife Service Occasional Paper, No. 000. Ottawa.

O'Connell, A. F. and A. T. Gilbert. 2002. Annual Conference of the Natural Science Collections Alliance, Washington, DC. Voucher Specimens of vertebrates and vascular plants originating in northeastern national parks: retrieval of the information and what they can tell us about biodiversity. (Poster Presentation).

O'Connell, A. F. and A. T. Gilbert. 2003. Using natural history collections to assess biodiversity. The GWS/CR2003 Joint Conference. San Diego, CA. (Oral Presentation)

O'Connell, A. F., and A. T. Gilbert. 2002. 12th Annual Conference of the Society of Environmental Journalists. Baltimore, MD. Voucher Specimens of vertebrates and vascular plants originating in northeastern national parks: retrieval of the information

and what they can tell us about biodiversity. (Poster Presentation).

O'Connell, A. F., and A. T. Gilbert. 2003. Retrieval, Compilation, and Exploratory Analyses of Voucher Specimens for Vertebrates and Vascular Plants in 14 Northeastern National Parks. Technical Report submitted to the National Park Service Inventory and Monitoring Program. (In review).

O'Connell, A.F., Jr, A. T. Gilbert, and J. S. Hatfield. (In review). The Influence of Natural History Collections and National Parks on Establishing a Database of Biodiversity. Conservation Biology.

Paton, P. W. C. Avian Surveys in Boston Harbor Islands: Preliminary Results. Scientific poster presented at the Boston Harbor Islands 2002 Biodiversity Seminar, May 30, 2002.

Paton, P. W. C., R. J. Harris, C. L. Trocki. (In Press). Distribution and abundance of birds during the breeding season in Boston Harbor. Northeastern Naturalist.

Paton, P. W. C., R. J. Harris, C. L. Trocki. Distribution and abundance of birds during the breeding season in Boston Harbor. Boston Harbor Islands Science Symposium, Boston Museum of Science 7 October 2003.

Shriver, W. G. 2003. The National Park Service Inventory and Monitoring Program. Presentation to the Appalachian Environmental Monitoring Initiative, New York Academy of Sciences, New York.

Shriver, W. G. 2003. The NPS Inventory and Monitoring Program: developing long term ecological monitoring in the Northeast Temperate Network. Boston Harbor Islands Science Symposium, Boston Museum of Science, 7 October 2003.

Shriver, W. G. 2003. The NPS Inventory and Monitoring Program: developing long term ecological monitoring in the Northeast Temperate Network. Presentation to the Appalachian Trail Conference, Fairlee Vermont.

Skidds, D. July 7-11, 2003 ESRI International User Conference, San Diego, CA, Using GIS for Quality Assurance / Quality Control (QA/QC) of a Herpetological Inventory of Northeastern National Parks.

V. Status of Park Vital Signs Monitoring

Northeast Temperate Network[1] 2003	Air Quality	Water Quality	Water Quantity	Geologic Resources	Plants	Animals	Landscape Characteristics
Planning and Design							
# parks monitoring w/ NETN funding	11	11	11	11	11	11	11
# parks monitoring w/ other funding	2	7	7	0	10	4	0
Protocols Implemented							
# parks monitoring w/ NETN funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	2	7	7	0	10	4	0
Analysis/Synthesis Available							
# parks monitoring w/ NETN funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	2	7	7	0	10	4	0

1. Values in this table include APPA for planning purposes in the NETN raising the number of parks from 10 to 11.

VI. USGS Protocol Development and Monitoring-Related Research Needs

- 2004-2005. An assessment of landscape scale indices to monitor landscape condition around parks using remotely sensed data.
- 2003-2004. Assessment of spatial scale for mammalian carnivore communities in the Northeast (USGS Allan O'Connell, USGS Patuxent).

VII. Budget Narrative and Budget Printouts

Budget Narrative: In FY 2003, the network received $121,580 from the NPS Servicewide I&M program for biological inventories, $481,200 Vital Signs Monitoring funds, $60,000 water quality funds, and $168,556 vegetation mapping funds to continue the design of the network's monitoring program. Inventory funds were allocated towards the mammal inventory through an interagency agreement with USGS and a cooperative agreement with the University of Rhode Island, to NCState University for data management aspects of biological inventories, to improve the species database for ACAD and to inventory invasive plants at MIMA and SAIR.

Monitoring funds were allocated to salaries for the network coordinator and data manager, setting up office space and equipment for the network's office, and establishing three new cooperative agreements to advance the development of ecological monitoring in network parks. Network parks identified adjacent land cover change as a primary threat to park resources, therefore the network established a cooperative agreement with a land cover change and remote sensing specialist at University of Rhode Island (Y.Q. Wang) to assess land cover change around networks parks over the past three decades. This project will provide parks with information about how the landscape has changed around parks in the wake of development pressure and aid in prioritizing natural resource and monitoring issues. The network established a cooperative agreement with a Great

Lakes Northern Forest CESU partner (State University of New York College of Environmental Science and Forestry) to work closely with network and park staff to; 1) identify priority natural resources and resource issues, 2) develop conceptual ecological models, and 3) identify potential indicators of ecological integrity. In tandem with this project, the network established an inter-agency agreement with the USGS Maine to follow the same process for water quality monitoring issues on network parks (see section below). Both projects have completed Phase 1 of their work and a presently initiating Phase 2 to prioritize monitoring Vital Signs. The network developed a database and hired a cooperator (through SUNY-ESF) to populate the database with ongoing monitoring programs in the northeast that may be potential partners with the NPS Vital Signs program. This searchable database summarizes information regarding monitoring program objectives, indicators measured, project duration, and contact information and will provide NPS and other interested parties with a "clearing house" of environmental monitoring programs in the region. Presently, 171 monitoring programs have been identified and summarized. Additional monitoring funds were spent on travel and administrative costs.

In FY 2003, the NETN received $60,000 from the Water Resources Division to begin the design of the water quality monitoring program. The funds were used to establish an interagency agreement with USGS to begin the scoping process for water quality monitoring in network parks. The USGS cooperators summarized existing information for water quality in parks, identified threats to water resources, and developed conceptual models to provide the framework for selecting water quality indicators in network parks.

Budget Summary

FY03 Admin Report Network: 14 Northeast Temperate

Category 1_Income

Description	$	$$ Source	Where $ Went	Comments
Water Quality Funds	$60,000.00	WRD - WQ Monitoring		
FY02 ERM owes NET $13499	$13,499.00	Other Partners		FY02 NET PAID MarshallU/Pauley; Year3 Vert.s GARI
FY02 MID owes NET $7820	$7,820.00	Other Partners		FY02 NET PAID Frost.St./Barry; Mammal Inv. RICH
FY02 ERM Owes NET $17967	$17,967.00	Other Partners		FY02 NET PAID USFS/Ford; Bats; NERI BLUE GARI
Inventory Funds	$121,580.00	I&M - Biol. Inventory $$		
Monitoring Funds	$481,200.00	I&M - VS Monitoring $$		
1/4 Regional Coordinator 2144-NII	$22,500.00	I&M - VS Monitoring $$		
Veg. Mapping Funds	$168,556.00	Veg. Mapping Program		
Subtotal	*$893,122.00*			

Category 2_Personnel

Description	$	$$ Source	Where $ Went	Comments
Admin. Awards	$1,076.50	I&M - VS Monitoring $$	NPS	Arego/Wollfe Spot Award
Network Coordinator Salary	$52,130.77	I&M - VS Monitoring $$	NPS	
Regional Coordinator Salary	$22,500.00	I&M - VS Monitoring $$	NPS	
Regional Coordinator Salary	$2,021.39	I&M - VS Monitoring $$	NPS	additional charge for Reg. Coord.
MIMA - SAIR Exotics Inventory	$17,700.00	I&M - Biol. Inventory $$	NPS	
Administrative Salary Office Support MABI	$19,042.65	I&M - VS Monitoring $$	NPS	
Data Manager Salary	$47,939.14	I&M - VS Monitoring $$	NPS	
Subtotal	*$162,410.45*			

Category 3_Coop. Agreements

Description	$	$$ Source	Where $ Went	Comments
Purchase Order S. Sand organize Coop. Agree.	$3,031.71	I&M - Biol. Inventory $$	Other non-Federal	share with other networks
URI/Land use chages/LandSat (NETN funded)	$86,354.71	I&M - VS Monitoring $$	Univ_Non-CESU	
USGS/Water Resouces Scoping	$60,000.00	WRD - WQ Monitoring	USGS	WRD portion of water scoping

URI/Mammal inventory	$41,956.00	I&M - Biol. Inventory $$	Univ_Non-CESU	
NC State/Data Management	$56,654.71	I&M - VS Monitoring $$	Univ_Non-CESU	Year 1 of multi-year project
USGS/Water Resources Scoping	$3,000.00	I&M - VS Monitoring $$	USGS	NETN portion of water scoping
Veg Mapping	$2,183.00	I&M - Biol. Inventory $$	Other non-Federal	NETN Portion of veg mapping
Partners in Flight	$500.00	I&M - Biol. Inventory $$	Other non-Federal	Partners in Flight Contribution
NatureServe/Veg. Map	$168,556.00	Veg. Mapping Program	Other non-Federal	
SUNY-ESF/Monitoring Program Data Mine	$20,015.29	I&M - VS Monitoring $$	University-CESU	
Syracuse/Monitoring Phase I	$106,315.00	I&M - VS Monitoring $$	University-CESU	
NC State/Data Management	$34,095.29	I&M - Biol. Inventory $$	Univ_Non-CESU	
URI/Land use change/LandSat (other networks funded)	$39,286.00	Other Partners	Univ_Non-CESU	Funds Repaid from other Network (2109=$31,466; 2108=$7,820)
USGS/O'Connell Mamal Inv.	$10,114.00	I&M - Biol. Inventory $$	USGS	
Acadia NPSpecies	$12,000.00	I&M - Biol. Inventory $$	Other non-Federal	
Subtotal	*$644,061.71*			

Category 5_Operations/Equipm

Description	*$*	*$$ Source*	*Where $ Went*	*Comments*
Equipment	$41,815.52	I&M - VS Monitoring $$	Other non-Federal	
Subtotal	*$41,815.52*			

Category 6_Travel

Description	*$*	*$$ Source*	*Where $ Went*	*Comments*
Travel	$44,834.32	I&M - VS Monitoring $$	NPS	
Subtotal	*$44,834.32*			

Budget Analysis

Analysis of Expenses by Where $ Went

Funding Source	Total $$	NPS	USGS	Other Federal	Univ.-CESU	Univ_Non-	Other non-Federal
I&M - Biol. Inventory $$	$121,580	$17,700	$10,114			$76,051	$17,715
I&M - VS Monitoring $$	$503,700	$189,545	$3,000		$126,330	$143,009	$41,816
Other Partners	$39,286					$39,286	
Veg. Mapping Program	$168,556						$168,556
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$893,122	$207,245	$73,114		$126,330	$258,347	$228,086

Analysis of Expenses by Category

Funding Source	Total $$	Personnel:	Coop	Contracts	Operations/Equi	Travel	Other
I&M - Biol. Inventory $$	$121,580	$17,700	$103,880				
I&M - VS Monitoring $$	$503,700	$144,710	$272,340		$41,816	$44,834	
Other Partners	$39,286		$39,286				
Veg. Mapping Program	$168,556		$168,556				
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$893,122	$162,410	$644,062		$41,816	$44,834	

Expense Totals By Category

Category	SubTotal	Percent
2_Personnel	$162,410	18.18%
3_Coop. Agreements	$644,062	72.11%
5_Operations/Equipmen	$41,816	4.68%
6_Travel	$44,834	5.02%
	$893,122	

Budget Summary

FY04 Work Plan Network: 14 Northeast Temperate

Category 1_Income

Description	$	$$ Source	Where $ Went	Comments
1/4 Regional Coordinator 2144-NII account	$30,000.00	I&M - VS Monitoring $$		
Water Quality Funds	$60,000.00	WRD - WQ Monitoring		
Additional Veg Mapping	$50,000.00	Veg. Mapping Program		
APPA from Mid-Atlantic	$80,200.00	I&M - Biol. Inventory $$		
Monitoring Funds	$631,200.00	I&M - VS Monitoring $$		
Subtotal	*$851,400.00*			

Category 2_Personnel

Description	$	$$ Source	Where $ Went	Comments
Data Manager	$60,000.00	I&M - VS Monitoring $$	NPS	Salary & Benefits (Approx)
Regional Coordinator	$30,000.00	I&M - VS Monitoring $$	NPS	1/4 RC 2144 NII Account
Network Coordinator	$64,000.00	I&M - VS Monitoring $$	NPS	Salary & Benefits (Approx)
Network Data Miner	$35,000.00	I&M - VS Monitoring $$	NPS	Stationed at ACAD (12-mo)
Network Data Miner	$21,000.00	I&M - VS Monitoring $$	NPS	Stationed at MABI (6-mo)
Subtotal	*$210,000.00*			

Category 3_Coop. Agreements

Description	$	$$ Source	Where $ Went	Comments
URI Land Use Change	$109,868.00	I&M - VS Monitoring $$	Univ_Non-CESU	Year-2 of Study
USGS Maine Water Resources	$60,000.00	WRD - WQ Monitoring	USGS	Phase-2 of Study
NC State Data Management	$6,750.00	I&M - VS Monitoring $$	University-CESU	Photo mosaics
Forest Monitoring Phase II	$100,000.00	I&M - VS Monitoring $$	University-CESU	SUNY-ESF
Veg Mapping	$50,000.00	Veg. Mapping Program	NPS	MABI, SAGA, MIMA, BOHA
APPA Planning	$80,200.00	I&M - Biol. Inventory $$	University-CESU	Inventory resources & develop monitoring plan for trail
UMASS IT Development	$15,000.00	I&M - VS Monitoring $$	University-CESU	Web development and other IT support
Mammal Inventory	$164,120.00	I&M - VS Monitoring $$	Other Federal	O'Connell
Subtotal	*$585,938.00*			

Category 5_Operations/Equipm

Description		$	$$ Source	Where $ Went	Comments
Equipment		$5,462.00	I&M - VS Monitoring $$	NPS	Equipment
MABI Operations		$20,000.00	I&M - VS Monitoring $$	NPS	Administrative Support
	Subtotal	*$25,462.00*			

Category 6_Travel

Description		$	$$ Source	Where $ Went	Comments
Travel		$30,000.00	I&M - VS Monitoring $$	NPS	Based on 03 travel less ~25%
	Subtotal	*$30,000.00*			

Budget Analysis

Analysis of Expenses by Where $ Went

Funding Source	Total $$	NPS	USGS	Other Federal	Univ.-CESU	Univ_Non-	Other non-Federal
I&M - Biol. Inventory $$	$80,200				$80,200		
I&M - VS Monitoring $$	$661,200	$265,462		$164,120	$121,750	$109,868	
Veg. Mapping Program	$50,000	$50,000					
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$851,400	$315,462	$60,000	$164,120	$201,950	$109,868	

Analysis of Expenses by Category

Funding Source	Total $$	Personnel:	Coop	Contracts	Operations/Equi	Travel	Other
I&M - Biol. Inventory $$	$80,200		$80,200				
I&M - VS Monitoring $$	$661,200	$210,000	$395,738		$25,462	$30,000	
Veg. Mapping Program	$50,000		$50,000				
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$851,400	$210,000	$585,938		$25,462	$30,000	

Expense Totals By Category

Category	SubTotal	Percent
2_Personnel	$210,000	24.67%
3_Coop. Agreements	$585,938	68.82%
5_Operations/Equipmen	$25,462	2.99%
6_Travel	$30,000	3.52%
	$851,400	

Appendix 1: Summary of Major Accomplishments

Northeast Temperate Network **-** This network of ten parks and, for planning purposes, the Appalachian Trail, includes Acadia NP, Boston Harbor Islands National Park Area, Marsh-Billings-Rockefeller NHP, Minute Man NHP, Morristown NHP, Roosevelt-Vanderbilt NHP, Saint Gaudens NHP, Saratoga NHP, Saugus Iron Works NHS, and Weir Farm NHS. As part of its Vital Signs Monitoring development efforts, the network includes active participation from the Northeast Coastal and Barrier Network, ongoing park monitoring programs, the Appalachian Trail Conference, scientists with the USGS, and a number of universities in the northeast.

FY2003 Network Objectives for Biological Inventories

1. Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
2. Conduct inventories targeted at taxonomic groups that are below the service-wide goal of 90% verification, or are of special concern to Network parks.
3. Conduct other baseline inventories identified has important to Network parks and the Network Vital Signs program.

FY 2003 Network Objectives for Vital Signs Monitoring:

1. Hire key personnel to track inventories, develop and implement the Vital Signs monitoring program.
2. Expand network staff to support network monitoring program development and data management.
3. Form a Board of Directors and Technical Steering Committee and have network charter signed.
4. Develop and implement a network data management plan including data inventory, data mining, and organization of inventory and monitoring data within the network.
5. Summarize existing data and understanding and prepare for vital signs scoping workshops.
6. Develop an FY03 water quality monitoring work plan as part of Vital Signs Monitoring plan.

Summary of Major Network Accomplishments During FY 2003 - The network hired a network coordinator and a data manager in FY2003 and initiated park-based scoping workshops to introduce the I&M staff to superintendents and park staff. These meetings focused on identifying priority natural resources for each park and the potential threats and stressors to those resources. Once these resources and issues were identified, a questionnaire was developed and submitted to all park staff. Park staff were then asked to identify natural resource management priorities and threats. This summary provided

the foundation for guiding the development of conceptual ecological models included in the Phase 1 report.

The newly hired network staff benefited greatly from the data mining and management efforts of the NCBN data management staff, especially Sara Stevens. Much of the existing park based information related to biological inventories was readily available when the NETN network coordinator and data manager arrived. Since that time, the network developed and implemented a file storage system in the network office where hard copies of park related documents are cataloged and stored. The NETN data manager adapted the NPS recommended computer directory structure to organize and maintain all park related digital documents, data, GIS coverage, etc. The NETN data manager also implemented a file sharing and data back-up system that insures data accessibility and integrity for park and network information. The NETN data manager compiled available spatial data that could apply to network parks from NPS, USGS, USFWS, USFS, NRCS, state and local agencies, NGO's, and other geographic information sources and integrated these sources of information into the network file sharing system.

Field work for most biological inventories in the network was completed during FY2003. Avian and herp inventories effectively sampled all parks in the network where data gaps for these taxonomic groups existed. Final products for these inventories are due in FY2004. A mammal inventory for network parks is scheduled to begin field work in FY2004. During scoping workshops, network parks identified invasive plant species as a priority threat to park natural resources. The network worked closely with the IPM/EPMT coordinator for the northeast region to determine what inventory products would be most helpful for the EPMT and supported inventories of invasive plant species on parks were these inventories were absent (MIMA and SAIR). The network also worked with MORR, a park with extensive invasive plant/over-abundance of deer issues, to develop a method to prioritize and control invasive plants.

The Appalachian Trail, identified as a natural resource park and included in the Inventory and Monitoring (I&M) program, presents many challenges and opportunities for long-term ecological monitoring. The at least 1000' wide corridor spans 2,100 miles from Maine to Georgia and traverses the complete range of elevational and latitudinal gradients in the eastern United States. The AT crosses 14 states, 6 NPS units, 8 National Forests, 31 Appalachian Trail Conference (ATC) Trail Clubs, and 5 I&M networks. The geographic extent, number of partner agencies, and unique management structure of the AT requires an extensive amount of coordination to plan and design an ecological monitoring program that will provide information to better manage the Trail's natural resources and information to better understand the ecological integrity of systems along the entire east coast. To that end, the NETN staff held multiple meetings during FY2003 to increase coordination among the many agencies and partners interested in environmental monitoring on the AT and is presently seeking funding to establish an APPA I&M point of contact for FY2004. Because the majority (80%) of the AT lands outside of other jurisdictions are located north of Maryland and to reduce the workload on AT staff, the Northeast Temperate Network will include the AT and the network

coordinator will assure communication across networks to prioritize biological inventories and to develop a vital signs program for the AT.

The network expanded staff through cooperative agreements with universities and through term positions to conduct specific inventories at parks. A cooperative agreement was established with the State University of New York College of Environmental Science and Forestry (through the Great Lakes Northern Forest CESU). This agreement focused on developing conceptual models for priority ecological systems within parks, listing potential indicators of ecological integrity for those systems, and integrating the natural heritage program ecological integrity ranking system into the long-term monitoring program. The network established a cooperative agreement with the University of Rhode Island to conduct an assessment of land cover change around network parks from 1973-present. During scoping workshops, parks identified adjacent land cover change as the principal threat to park resources. The URI team will use LandSat imagery to quantify the effects of land cover change on parks over the past three decades. This analysis will also incorporate existing conservation lands around parks and conduct a "mini-GAP analysis" to assess what habitats are least conserved around park lands and provide a landscape context to assist in prioritizing park ecosystems for long-term monitoring. Parks also identified invasive plant species as a high priority threat and the network responded to these issues by determining which network parks did not have invasive plant inventories and hiring staff to conduct these inventories. Presently, all network parks have an assessment of invasive plant species within the park and a list of priorities in preparation for the Exotic Plant Management Teams.

The network formed a board of directors consisting of the superintendents of network parks and the network and regional I&M staff. The network organized and hosted a board of directors meeting 1 month after the network coordinator was hired. During this meeting the board reviewed and agreed to sign the network charter. A signatory page was circulated around the network and submitted to the regional and national offices. The network also established a technical steering committee and developed specific roles and responsibilities for steering committee members. The network will host a steering committee meeting in early FY2004 to review the work plan for 2004, the Phase 1 report and discuss the process of prioritizing Vital Signs for Phase 2 reporting.

The network data manager drafted a data management plan included in the Phase 1 report. Network staff established and organized a file storage and retrieval system in the network office for both digital and hard copy park documents.

The network chose to hold park-based scoping workshops to identify park resources and threats to those resources. All existing park general management plans and resource management plans were collected and summarized. Previous scoping workshops were used to generate a questionnaire for park staff to prioritize natural resources and natural resource threats. The network data manger developed a database of ongoing monitoring programs adjacent to parks. A cooperative agreement was established to hire a "data miner" to populate the database and identify the objectives, duration, contacts, and indicators associated with monitoring programs in the northeast. This database presently

has 171 programs identified and will be a valuable resource for parks and other parties interested in ecological monitoring in the region and will provide opportunities for the I&M program to develop partnerships with ongoing programs.

The network established and interagency agreement with USGS to assist in the development of water quality monitoring for network parks. The agreement follows the phased reporting established by the I&M program. The first Phase of this project was completed 15 September 2003 and provided summaries of existing information regarding water quality within network parks, identified threats to water resources, and developed conceptual models for each park in the network where water resources and indicators of aquatic system integrity were defined.

Public Interest Highlights

- The partnership with SUNY-ESF and NatureServe is integrating natural heritage ecological integrity ranking into the design of the long-term monitoring programs and establishing partnerships with state natural heritage programs;
- The completed vegetation map at Acadia is already being used as a sampling frame for the mammal inventory and is assisting in setting priorities for monitoring;
- A Vital Signs Scoping workshop held in conjunction with the Boston Harbor Island Science Symposium successfully identified a list of candidate vital signs for the National Park area;
- The NETN established a partnership with the Appalachian Trail Environmental Monitoring Initiative and the Appalachian Trail Conference to advance ecological monitoring on the AT Corridor;
- Invasive plant inventories at MABI, MIMA, and SAIR identified exotic plant species within park boundaries previously not know to occur;
- Continued partnership with the Invasive Plant Atlas of New England and coordinated field tour of Saratoga NHP to illustrate park threat caused by the interaction between deer over-abundance and invasive plant species;
- Coordinated with MABI and Olmsted Center staff to integrate the I&M program into the forest management plan for the park;
- A least bittern nest was found at Bass Harbor Marsh, Acadia NP, as part of the marsh bird survey;
- Eight new locations of the four-toed salamander (a species of special concern) were identified at Acadia NP as part of the network herp inventory.
- Five high conservation priority bird species were detected on >50% of the point count stations at Marsh-Billings-Rockefeller NHP as part of the avian inventory that also added 7 bird species to the official species list for the park.